Prevalence of Asymptomatic Bacteriuria in Children and Adolescents with Type 1 Diabetes Mellitus

Thesis

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By

Marwah Ahmed Attieh Mohammed (M.B., B.Ch-2002)

Under supervision of

Prof. Dr. Mona Abdel-Kader Salem

Professor of Pediatrics
Faculty of Medicine- Ain Shams University

Ass.Prof.Dr. Randa Mahmoud Asaad Sayed Matter

Assistant Professor of Pediatrics
Faculty of Medicine- Ain Shams University

Dr. Abeer Ahmed Abdel-Maksoud

Lecturer of Pediatrics
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
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List of Abbreviations

List of abbreviations

| ADAAmerican Diabetes Association |
|----------------------------------|
|----------------------------------|

AERAlbumin excretion rate

AIDS Acquired Immune Deficiency Syndrome

ASBAsymptomatic bacteriuria

AUC.....Area under the curve

BMI ·····Body Mass Index

CDCCenters for Diseases Control and prevention

CFU ·····Colony forming unit

CGMS······Continuous glucose monitoring system

CI.....Confidence interval

CSIIContinuous subcutaneous insulin infusion

CT ·····Computed tomography

CTLA-4 ······Cytotoxic T lymphocyte antigen 4

DCCT ······Diabetes Control and Complications Trial research group

DKADiabetic Ketoacidosis

DM·····Diabetes mellitus

DMSA Dimercaptosuccinic acid

DNA Deoxyribonucleic acid

ER ·····Emergency room

ESRD End-stage renal disease

FPG·····Fasting plasma glucose

🕏 List of Abbreviations

List of abbreviations (Cont.)

| GAD | ··Glutamic Acid Decarboxylase |
|---------------|--|
| GDM | ··Gestational diabetes mellitus |
| HbA1c······ | ··Glycosylated hemoglobin |
| HBD-1 ······· | ·Human beta-defensin-1 |
| HHS | ·Hyperosmolar hyperglycemic state |
| HLA | ·Human Leucocytic Antigen |
| HNF1α······· | · Hepatic nuclear transcription factor 1 alpha |
| HNF4α······· | ·Hepatic nuclear transcription factor regulating |
| | HNF1α |
| HNS | · Hyperosmolar non-ketotic state |
| IAA | ·Insulin autoantibodies |
| ICA | ··Islet cell antibodies |
| ICU | ·Intensive care unit |
| IFG······ | ·Impaired fasting glycemia |
| IGT | ·Impaired glucose tolerance |
| ISPAD | ·International society for pediateric and |
| | adolescents Diabetes |
| IVP | ·Intravenous pyelogram |
| LDL | Low density lipoprotein |
| MODY ······ | ·Maturity onset diabetes in young |
| MRBG ······ | ·Mean random blood glucose |
| MRI ····· | ·Magnetic Resonance Imaging |
| NPDR ······ | ·Non-proliferative diabetic retinopathy |
| NPH | ·Neutral Protamine Hagedron |

List of Abbreviations

List of abbreviations (Cont.)

OGTTOral glucose tolerance test

O.ROdds Ratio.

PDRProliferative diabetic retinopathy

P.....Statistical value

ROC..... Receiver Operating Characteristic

SB ·····Significant bacteriuria

SD.....Standard deviaton

SGG ·····Sialosyl galactosyl globoside

SMBG·····Self-monitoring of blood glucose

SPA·····Suprapubic aspiration

SPSSStaistical package for social sciences

TMP-SMX ···· Trimethoprim-sulfamehoxazole

UAEUrinary albumin excretion

UKDPSUnited Kingdom Diabetes Prospective Studies

UPECUropathogenic E. coli

UTIUrinary tract infection

VCUGVoiding cystourethrogram

WHO World Health Organization

X ······Mean

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Introduction

Diabetes mellitus (DM) is a metabolic disease characterized by hyperglycemia. It is caused by deficiency of insulin secretion or insulin action or both and results in abnormal metabolism of carbohydrate, protein and fat. It is most common endocrine-metabolic disorder of childhood and adolescence with important consequences for physical and emotional development (Mark, 2000).

Asymptomatic bacteriuria (ASB) was defined as the presence of $> 10^5$ colony-forming units/mL of one or two of the same microorganisms in a culture of clean-voided midstream urine from a patient without symptoms of urinary tract infection (UTI) (Geerlings et al., 2001).

Asymptomatic bacteriuria is common. Populations with structural or functional abnormalities of the genitourinary tract may have an exceedingly high prevalence of bacteriuria, but even healthy individuals frequently have positive urine cultures (*Nicolle*, 2003).

The prevalence of significant bacteriuria (S.B) in diabetes mellitus has not been clearly established (Mattcucci et al., 2007).

Introduction

Rozsai et al., (2003) reported that the prevalence of ASB and leukocyturia was higher in diabetic children and young adults than in control subjects and that the spectrum of bacteria in patients with ASB was different from the usual spectrum in patients with UTI.

Aim of the work

The aim of the work was:

- To investigate the prevalence of asymptomatic urinary tract infection among patients with types I diabetes mellitus.
- To identify the type and antibacterial sensitivity patterns of the organisms causing these UTIs.
- To study the correlation between ASB and both the presence of microalbuminuria and the degree of glycemic control.

Diabetes Mellitus

Definition

Diabetes mellitus (DM) is a clinical syndrome of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion (absolute or relative), insulin action or both. Lack of insulin affects the metabolism of carbohydrate, protein, fat, and causes significant disturbance of water and electrolyte homeostasis (*ISPAD*, 2007).

The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs. The long-term effects include progressive development of specific complications such as, retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy (*American Diabetes Association*, 2005).

Several pathogenetic processes are involved in the development of diabetes. These processes destroy the beta cells of the pancreas with consequent insulin deficiency, and others that result in resistance to insulin action. The abnormalities of carbohydrate, fat and protein metabolism are due to deficient action of insulin on target tissues resulting from insensitivity or lack of insulin. The etiology and pathophysiology leading to the hyperglycemia, however, are markedly different among patients